



SUBJECT

COHERENCE LENGTH PHOTOS

NAME

ED WESLY

DATE

11/13/85

REVISION DATE

## EXPLANATION:

THE PULSEWIDTH IN  $\mu\text{s}$  IS VISIBLE ON THE "SIGN POST" IN EACH HOLOGRAM, ALONG WITH A "P" ON SOME WHICH DENOTED THAT THE HOLOGRAMS WERE TAKEN ON THE PING CYCLE. THEY ARE VISIBLE ONLY FAINTLY ON THE  $15\mu\text{s}$  AND NOT AT ALL ON THE  $2\mu\text{s}$  FOR PHOTOGRAPHIC REASONS. A MIRROR WHICH WAS USED IN THE REFERENCE PATH IS VISIBLE SLIGHTLY ABOVE THE CENTER OF THE PHOTO, WITH A NITROGEN TANK TO ITS RIGHT. AN ELECTRONICS RACK TO THE LEFT OF THE MIRROR WAS MASKED OFF WITH BLACK CLOTH, SO IT IS NOT SEEN, HOWEVER THE SHADOW WHICH IT CAST ON THE REAR WALL IS SEEN ON SOME OF THE BETTER SHOTS. IN THE LOWER LEFT OF SOME HOLOS A PIECE OF BURN PAPER WHICH WAS USED TO BLOCK OFF STRAY LIGHT IS VISIBLE, ABOVE IT ARE SOME UMBILICAL CORDS TO THE LASER.

THE COHERENCE LENGTH VISIBLE IN THE HOLO CAN BE FOUND BY READING THE HIGHEST NUMBER VISIBLE ON THE BAR, MULTIPLYING IT BY 2 AND THEN ADDING ONE TO THE PRODUCT.

## ANALYSIS OF THE HOLOGRAMS (IN ORDER OF DESCENDING PULSEWIDTH)

AT  $60\mu\text{s}$  THE HOLOS ARE NOT VERY BRIGHT, AS THERE WAS ENOUGH MOVEMENT DURING THESE EXPOSURES TO SPOIL THE HOLOGRAPHIC FRINGE SYSTEM. THE OPTICAL BENCH IS NOT VISIBLE, AND THE UMBILICAL ONLY IN SPOTS, PROBABLY DUE TO THE  $\text{H}_2\text{O}$  FLOWING THROUGH IT.



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40 $\mu$ s IS A BIT BETTER, WITH THE BAR VISIBLE TO SOME DEGREE, SHOWING THE "BEATS" OF THE COHERENCE LENGTH AS DARK FRINGES ALONG THE BAR. AGAIN THE UMBILICAL'S IMAGE IS SPOILED BY THE THROB OF THE COOLANT.

20 $\mu$ s SHOWS 6m OF COHERENCE, HOWEVER MOTION SPOILS THE HOLOGRAM IMAGE OF THE OPTICAL TABLE AND UMBILICAL.

HOWEVER THE BURN PAPER DOES APPEAR IN THE SECOND "BEAT" OF THE COHERENCE VOLUME.

THE 15 $\mu$ s PHOTO SHOWS AN ANOMALOUS RESULT - COHERENCE LENGTH BEATS APPROXIMATELY EVERY 2 meters. NOT ALL THE 15 $\mu$ s PULSES WERE LIKE THIS - GENERALLY THEY LOOKED LIKE THE 10 $\mu$ s BUT ONCE IN A WHILE THE LASER WOULD HICUP INTO A MODE LIKE THIS.

10 $\mu$ s HAS ABOUT THE SAME COHERENCE AS 20 $\mu$ s, BUT MORE OBJECTS APPEAR DUE TO THE SHORTER PULSE WITH MORE TOLERANCE TO MOVEMENT.

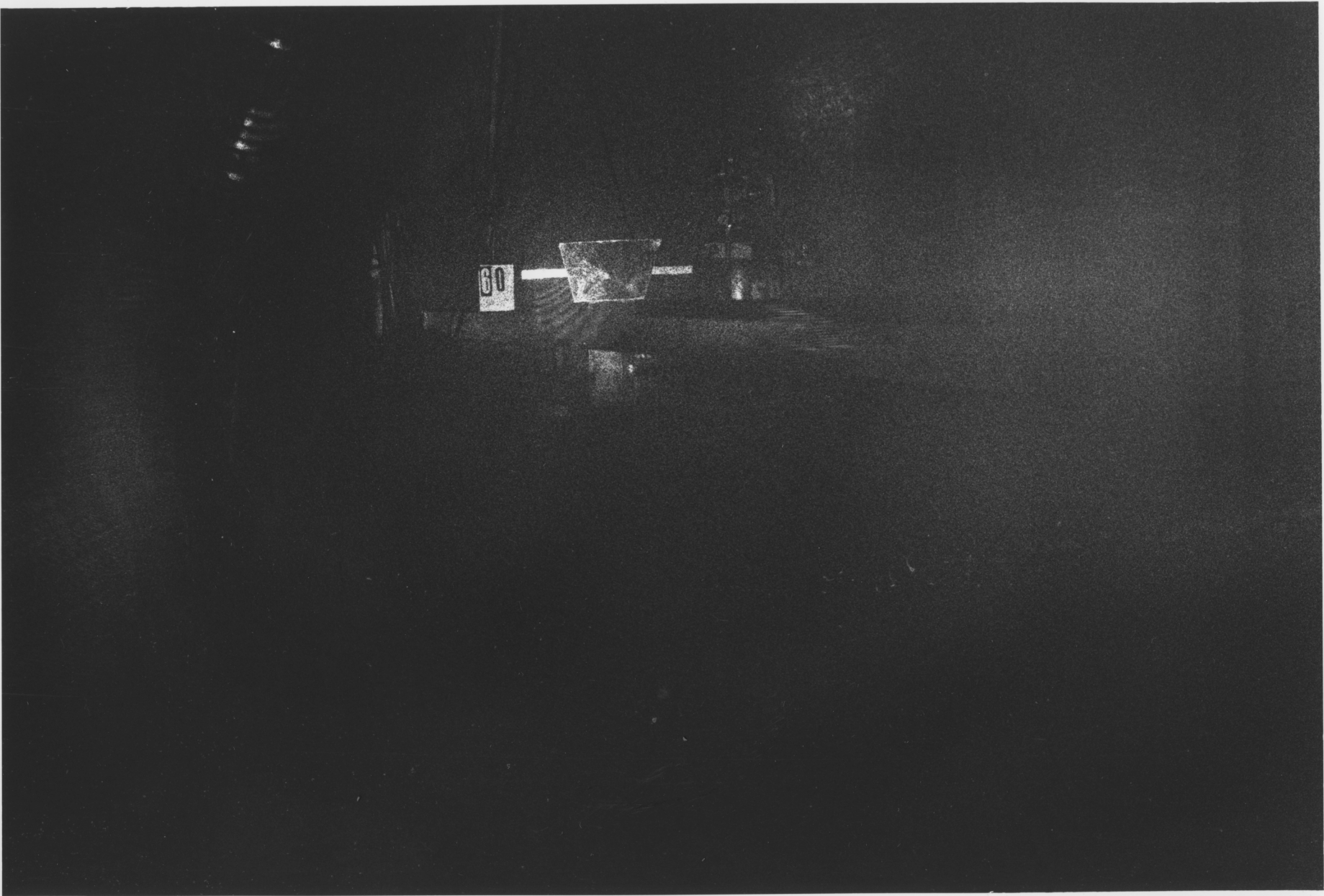
THE 5 $\mu$ s HAS THE BEST PRINTING JOB FROM THE PHOTO SERVICE. SEEING THE BURN PAPER CONFIRMS THE  $> 8$ m COHERENCE LENGTH. NOTICE THAT THE UMBILICAL CABLE AND THE EDGE OF THE LASER ARE ALL THERE.

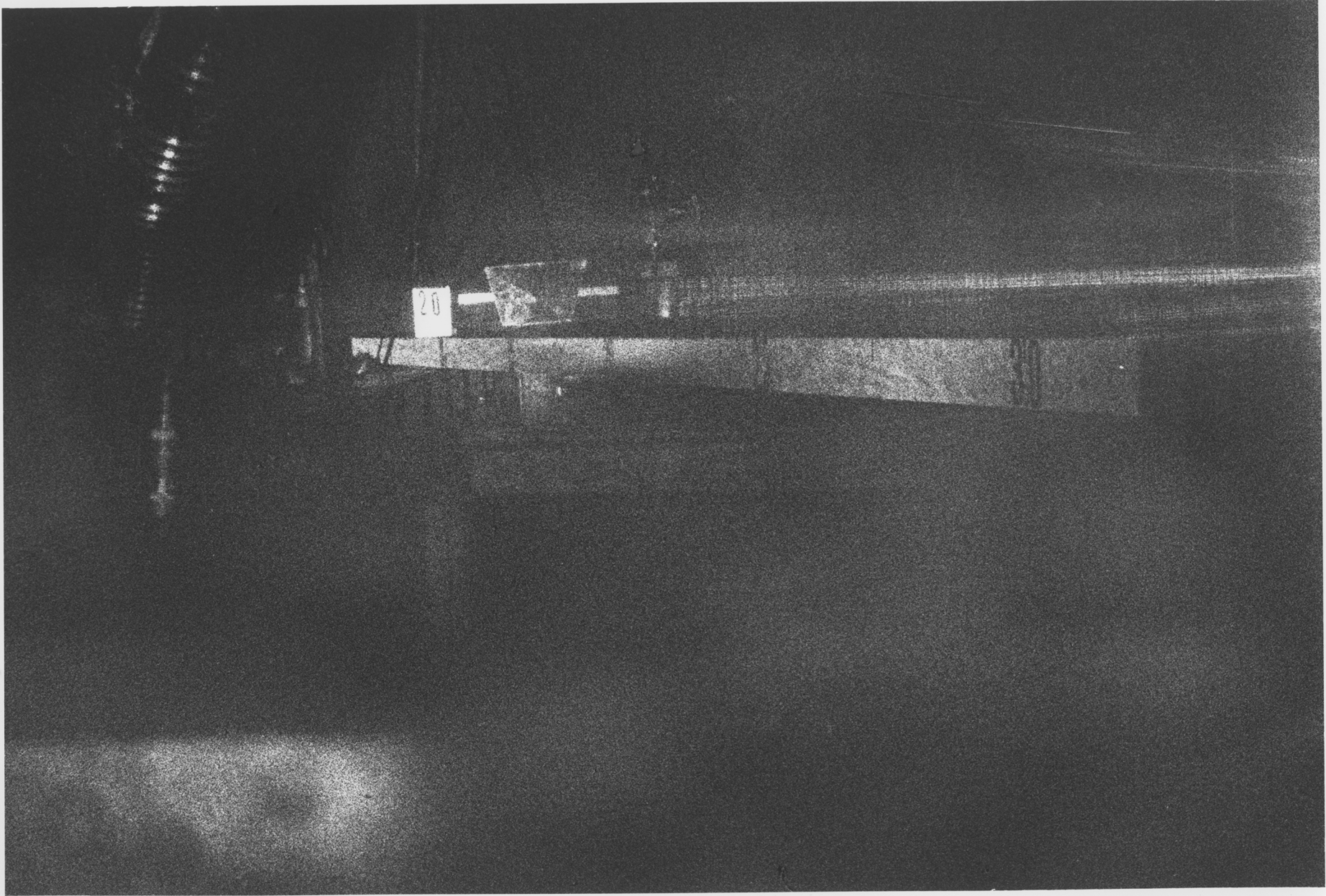
2.0 $\mu$ s DELIVERED THE BEST HOLOGRAM.

THE PHOTO IS PRINTED A BIT TOO CONTRASTY, BUT EVERYTHING IN THE FIELD OF VIEW OF THE HOLOGRAM CAME OUT WELL.

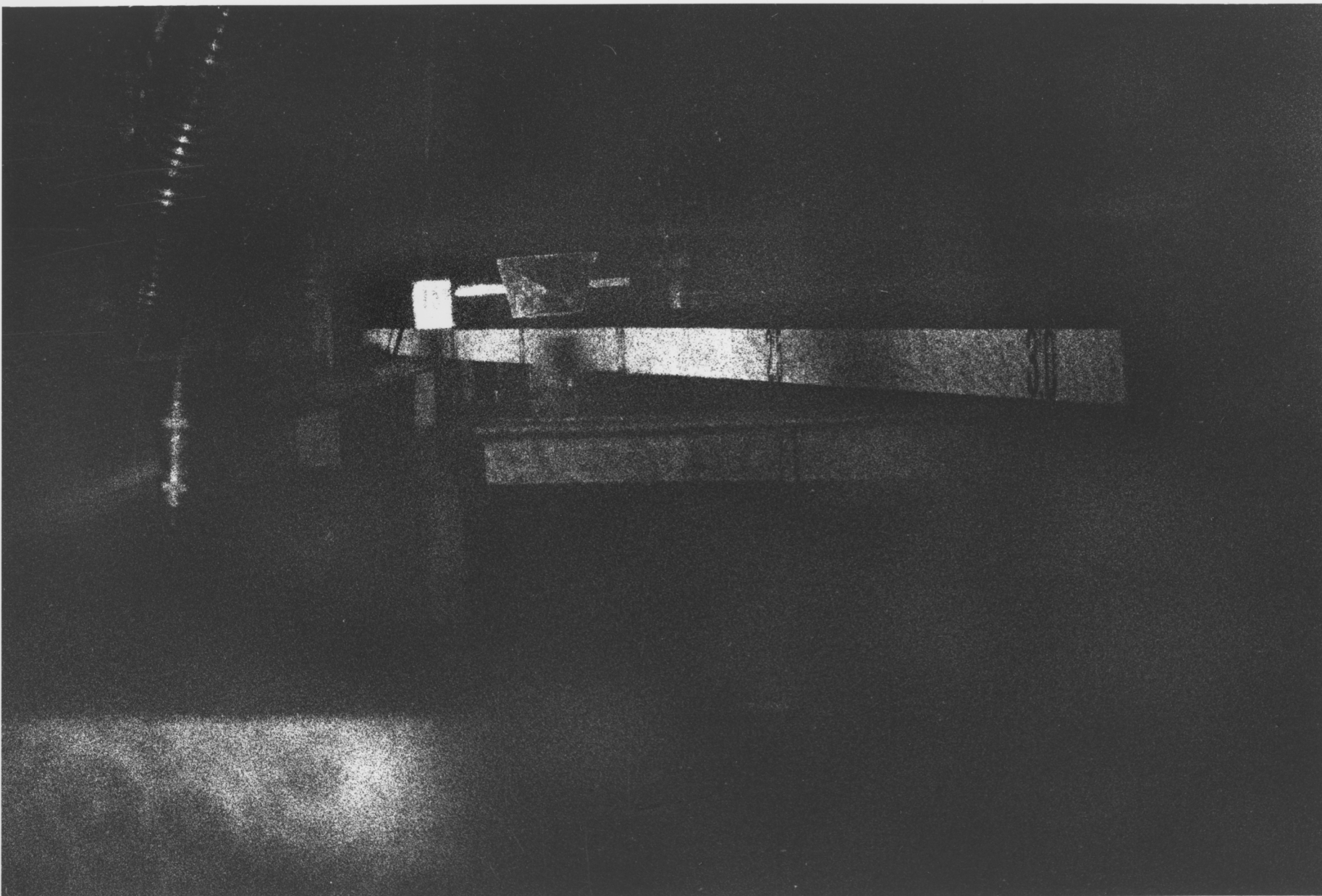
NOTE: SOME SETS MAY BE LACKING SOME OF THE ABOVE PRINTS. THE PHOTOS OF THE Q-SWITCH PULSE WERE UNACCEPTABLE.











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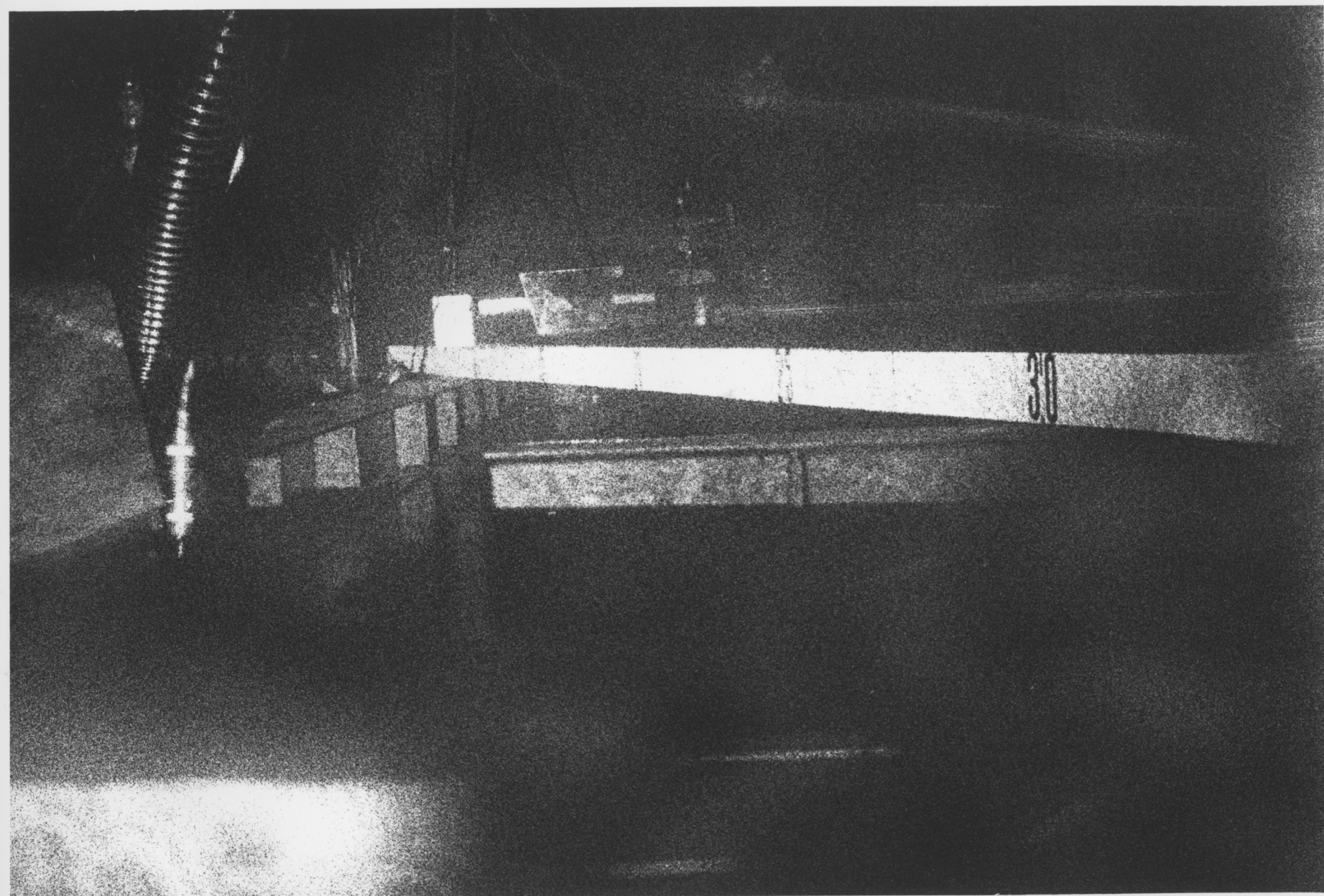
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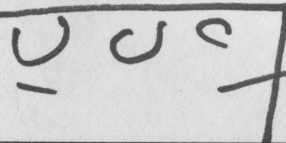




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MAKE SURE  
DETAILS ARE  
VISIBLE



OUT OF FOCUS STUFF SHOULD  
BE DARKER

THIS AREA IS  
A SHADOW - BLACK AS POSSIBLE

LT. GRAY, SO THAT  
2.5 IS VISIBLE. MAY  
HAVE TO BURN IN

BIT DARKER GRAY,  
SO THAT NUMBERS  
ARE BLACK

BACKGROUND  
SHOULD BE DARKER